What Is Claimed Is:

1. A method for illuminating the interior of an eye through the sclera of the eye, comprising

focusing a light beam on the sclera by focusing optics while maintaining the focusing optics out of contact with the sclera.

2. The method of claim 1. wherein said step of focusing is carried out with opto-mechanical means operative to direct the focused light beam to a desired position on the sclera.

3. A system for ophthalmic illumination of the interior of the eye of a patient through the sclera of the eye without touching the eye comprising:

a light source;

illumination optics that focus the light from the light source to a light spot on the sclera without touching the sclera; and

opto-mechanical means for directing the focused beam to a desired position on the eye sclera.

4. The system of claim 3, wherein said light source is a lamp.

5. The system of claim 3, wherein said light source is composed of a plurality of small light sources.

6. The system of claim 3, further comprising means for controlling the shape of the light spot that is created on the sclera by the focused beam.

7. The system of claim 6, in which the shape of the light spot is one of: circular; elongated; and slit-like.

8. The system of claim 7, in which the light spot is elongated and is oriented with a longer axis parallel to the eyelids such that the amount of light falling on the sclera without hitting the eyelids is maximized, and at least part of the light falls exactly at an optimal position on the sclera.

9. The system of claim 3, further comprising means for controlling the size of the light spot that is created by the focused beam on the sclera.

10. The system of claim 3, further comprising means for controlling the distance of the optics from the eye.

11. The system of claim 3, further comprising means for controlling the angle relative to the central optical axis of the eye at which the center of the focused beam reaches the sclera, thus controlling the distance of the light spot on the sclera from the limbus on one side and from the corner of the eye on the other side, and accordingly adjusting to an optimal position of the light spot relative to eye size.

12. The system of claim 3, further comprising means for controlling the angle at which the center of the focused beam reaches the sclera.

13. The system of claim 3, further comprising observation and imaging optics for observing and imaging portions of the eye illuminated by the illumination optics and opto-mechanical means.

14. The system of claim 13, wherein the illumination optics comprise a final element with light blockers that extend to the eyelids and prevent light that is reflected or scattered from a surface of the eye from reaching the observation and imaging optics.

15. The system of claim 3, further comprising means for controlling spectral content of the light from the light source.

16. The system of claim 3, further comprising means for controlling the intensity of the light in the light spot.

17. The system of claim 3, further comprising means for timing all controls.

18. The system of claim 3, further comprising programmed controls that are automatically adjustable according to feedback obtained from a light detector.

19. The system of claim 3, further comprising means for efficiently switching the focused beam from eye to eye.

20. The system of claim 3, further comprising optics for focusing two light beams on the eye sclera simultaneously, one on the nasal side of the eye and the other one on the temporal side of the eye.

21. The system of claim 3, further comprising optics for focusing two light beams on the sclera of both eyes.

22. The system of claim 3, further comprising optics for focusing four light beams on the eye sclera of both eyes, two beams for each eye, one on the nasal side and the other one on the temporal side.

23. The system of claim 3, wherein the light source and illuminating optics are coupled to a chin rest system that fixes a patient's face and eye position relative to the light spot and with the possibility of directing the orientation of the eye.

24. The system of claim 3, wherein the light source and the optics are coupled to an optical observation system that is used to observe and image the interior of the eye in a way that whenever the optics is properly positioned so to observe the interior of the eye, the light spot is properly focused at a desired location on the eye sclera.

25. The system of claim 24, wherein said optical observation system couples all degrees of freedom between said optical system and the light source, apart from rotation, so that said optical observation system can observe the interior of the eye from different angles while the focused light spot remains positioned appropriately on the eye sclera.

26. The system of claim 3, further comprising an optical fiber that is coupled to convey light from said light source to optics that lie close to the patient's eye and focus the light on the sclera of the eye.

27. The system of claim 26, wherein said optics are coupled to a chin rest system that fixes the patient's face and eye position relative to the light spot and with the possibility of directing the orientation of the eye.

28. The system of claim 26, wherein said optics are coupled to an optical observation and imaging system that is used to observe and image the interior of the eye in a way that whenever the optics is properly positioned so to observe the interior of the eye, the light spot is properly focused at the desired position on the eye sclera.

29. The system of claim 28, wherein said system couples all degrees of freedom between the optical observation and imaging system and the light source, apart from rotation, so that the optical observation and imaging system can observe the interior of the eye from different angles while the light spot remains positioned appropriately on the eye sclera.

30. The system of claim 3, further comprising two optical fibers that are coupled to convey light from said light source to two optics, which focus the light on the eye sclera at the nasal and temporal sides simultaneously.

31. The system of claim 30, wherein said optics are coupled to a chin rest system that fixes the patient's face and eye position relative to the light spots and with the possibility of directing the orientation of the eye.

32. The system of claim 30, wherein said optics are coupled to an optical observation and imaging system that is used to observe and image the interior of the eye in a way that whenever the optics is properly positioned so to observe the interior of the eye, the light spots are properly focused at the desired positions on the eye sclera.

33. The system of claim 32, wherein said system couples all degrees of freedom between the optical observation and imaging system and the light source, apart from rotation, so that the optical observation and imaging system can observe

the interior of the eye from different angles while the light spots remain positioned appropriately on the eye sclera.

34. The system of claim 3, further comprising two optical fibers that are coupled to convey light from said light source to two optics, one for each one of the patient's eyes, which focus the light on the sclera of the eyes.

35. The system of claim 3, further comprising four optical fibers that are coupled to convey light from said light source to four optics, two for each one of the patient's eyes, which focus the light on the eye sclera at the nasal and temporal sides simultaneously.

36. The system of claim 3, further comprising an observation and imaging optics that shares components with said illumination optics and creates the focused light spot at a predetermined distance from the center of an optical axis so that the focused light spot impinges on the eye sclera at an optimal location for light penetration.

37. The system of claim 36, wherein said system creates at least two spots of focused light on the sclera of the eye at spaced points on a circle around a central optical axis at optimal locations for light penetration, and said system further comprises a control mechanism that selects the best illumination spot for each position of the optical observation and imaging system.